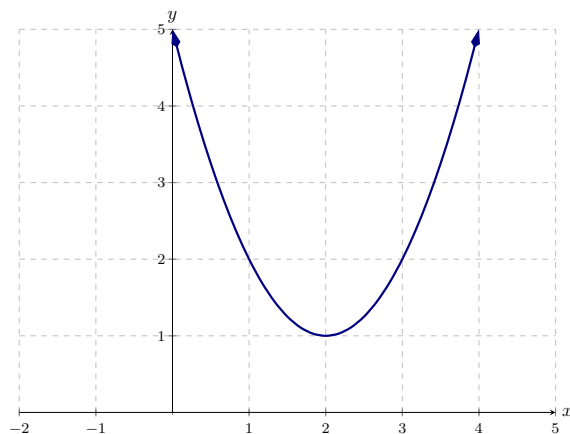


Exercise 1 The function given by $f(x) = 3(x - 2)^2 + 1$ (graphed below) is not a one-to-one function on $(-\infty, \infty)$. If we restrict the domain, however, it can be made to be one-to-one.



Find a formula for $f^{-1}(x)$ when f is restricted to $(-\infty, 2]$.

$$f^{-1}(x) = \boxed{2 - \sqrt{\frac{x-1}{3}}}$$

Hint: We're starting with $y = f(x)$, so that's:

$$y = \boxed{3(x - 2)^2 + 1}$$

Swap x and y .

$$x = \boxed{3(y - 2)^2 + 1}$$

Solving for y you find two solutions. They are:

$$y = 2 - \sqrt{\frac{x-1}{3}}$$

$$y = 2 + \sqrt{\frac{x-1}{3}}$$

The domain of f was restricted to $(-\infty, 2]$, which means we want the range of f^{-1} to be $(-\infty, 2]$. Which of the two solutions you found give outputs which are not greater than 2?